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buds by which the plant is propagated. They are very easily detached from the old stems, and then readily float, and are carried by stream.

S. E. Cassino, Salem, Mass., announces the publication, June 10th, of Ferns in their Homes and Ours, by John Robinson, to be illustrated with eight chromo-lithographs of rare ferns with other illustrations.

ZOÖLOGY.[1]

CHANGE BY ARTIFICIAL MEANS OF A LAND TO AN AQUATIC SALAMANDER.—Some very interesting experiments have recently been made by Madame von Chauvin, regarding the change, by artificial means, in the Alpine salamander of a land to an aquatic life. From a translation of the paper in *Nature*, we take the following account, often word for word. The former success of Madame von Chauvin in inducing the development of *Amblystoma* from the Mexican axolotl by gradually accustoming it to live in air, induced her to attempt to change the habits of *Salamandra atra*. This is an ovo-vipiparous species, and although its young possess large gills while within the body of the mother, they are born to begin a land-life immediately, while *Salamandra maculata* brings forth its young with gills, and they live for some time in water before taking to land. The problem to be solved was whether the young of the black salamander, taken from the mother before the normal time of birth, and placed in water under favorable conditions, could become adapted to an aquatic life. Out of twenty-three larvæ of the Alpine salamander (*S. atra*) one, unlike the rest, appeared at ease when placed in water and made no attempt to get out of it, and was fed regularly. The gills, too delicate and thin for life in the water even, dropped off by the third day, but soon a second smaller set of gill-fringes grew out, which appeared to perform the work of respiration perfectly; the creature remained completely beneath the surface of the water, without ever coming up to breathe air. While the new gills were being developed the larva remained at rest as if dead, only eating the earthworms when they were offered. When the gills had attained a length of 2.2 mm., the larva became lively, and concurrent with this was the completion of another transformation. The delicate and transparent swimming membrane of the tail was lost, and replaced by a less transparent and stouter one, of greater dimensions. Finally, after six weeks' residence in the water, the skin began to be shed. Fourteen weeks after having been placed in the water, when six centimetres long, the gills began to shrink, and the tail to assume a rounder form, and in three days the skin was shed, revealing the normal black and wrinkled skin of the land salamander. At last it crawled out of the water, and on the fourteenth day the gills were completely absorbed and the gill-clefts absorbed. The remaining larger larvæ of this experiment lost their primary gills less satisfactorily and in a greater length of time. New gills began to bud, but the animals were gradually destroyed by fungus-growths attacking various parts of their skin. The fact that they were altogether more advanced in their metamorphosis rendered them unable to adapt themselves quickly to their new conditions. Similar experiments were less successful the next year, none adapting themselves to an aquatic life. It was thought from these experiments that the spotted and Alpine salamanders were at no very distant period of time one species, and that as physical conditions became changed one variety became more and more adapted to more elevated and rocky regions, where water for the early life of the larvæ was not commonly to be met with. Thus gradually the birth of the young was postponed, and they became terrestrial; concurrently fewer and fewer of the many eggs were developed. The spotted salamander, meanwhile, became more and more specialized to inhabit the lowland district. The bearings of these facts on evolution are of much pertinence.

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[1] The departments of Ornithology and Mammalogy are conducted by Dr. ELLIOTT COUES, U. S. A.

RIDGWAY'S ORNITHOLOGY OF THE FORTIETH PARALLEL.—The ornithology, by Mr. R. Ridgway, of the route explored by the U. S. Geological Explorations of the Fortieth Parallel, Clarence King in charge, has been lately published. The region investigated lies between Sacramento, Cal., and Salt Lake City, and the work is based on field work from June, 1867, to August, 1869, inclusive; 769 skins and 753 nests and eggs having been collected. This is in fact a work on the avifauna of the Great Basin, and the subject is discussed under four subdivisions: arboreal, terrestrial, mural and aquatic avifauna. Although the Great Basin forms a "natural province of the western region," Mr. Ridgway states that the Sierra Nevada and main Rocky Mountain Range form "much less of an actual barrier to the distributions of the species than might be supposed," and he thinks that the deserts check the distribution of the species. The author shows that Western birds "have a tendency to extend eastward during their fall migrations, thus spreading over the whole of the Western Region at this season, though in summer their habitat may be confined strictly to the area of Pacific coast drainage." He also discovered that several species supposed to be peculiarly eastern, really inhabit the entire breadth of the continent. The work is a store-house of novel discoveries regarding the distribution and habits of the birds of the Central Province of the United States, and of a high degree of interest and value at this time, though tardily published by Government. It forms Part III. Ornithology, of vol. iv. of King's Geological Explorations of the Fortieth Parallel, lately (1877) issued by the War Department.

A TWO-HEADED SNAKE.—On page 264 of your journal for April I notice an account of a two-headed snake—*Pityophis sp.*, and as I have recently discovered one in the reserve series of reptiles of the National Museum of the Smithsonian Institution, I venture to forward a description trusting it may possess some little interest to your readers.

This specimen, No. 7276 Smith. Coll., was presented by Miss Marshall, of Port Tobacco, Md., and is the specimen known as *Ophibolus getulus* (*Linn.*) Cope, the common chain or king snake. It has two perfect heads, both possessing the scale formula which characterize the species. The length of the specimen from the extremity of the right head to the end of the tail is 9 7-10 inches, length from extremity of left head to tip of tail 10 inches, by which it will be seen that a slight difference exists. The left head and neck and continuation although somewhat smaller than the right, appears to be the snake proper, the right a sort of graft on the main trunk. The two heads are 11-16 of an inch apart and ½ an inch from the end of each nose a fold of skin commences on the inner side of each neck, this being on a level with the commissure of the mouth. The color of the two white rings on each head posterior to the occipital plates, which are normal, are produced across this fold of skin, and a second white ring on the left head also passes down to the fold. This extends backwards 5-16ths of an inch from its anterior border and then the two spinal columns are welded together. The two œsophagi terminate in a common one a little posterior to the line of union. In all other respects the specimen is a typical *O. getulus.* The scutellæ below and behind the fold of skin run directly across both necks and bodies, no median line separating them, but become normal a little posterior to the juncture of the heads. When the two heads are compressed laterally together, the left one is found to be slightly longer than the right, which is a trifle larger. There are two white rings on each neck, the posterior one on the right a little behind the corresponding one on the left. This is the only two-headed snake in the enormously large collection of reptiles in the Smithsonian Institution, which I have lately gone over.—*H. C. Yarrow, Smithsonian Institution, Washington, D. C., April* 3, 1878.

NOTES ON THREE RARE BIRDS OF MINNESOTA.—Within the last few years ornithologists in and about Minneapolis, Minnesota, have found three species of birds conceded to be among the least familiar forms of our American feathered population.

One of these is the Bohemian Chatterer, or Northern Waxwing (*Ampelis garrulus*). For the past five years at least, this bird has been a regular winter resident here, arriving early in December and taking its departure in March. It is rarely observed except in large flocks, which are almost incessantly astir.

The food of the species in this latitude consists for the most part of berries, especially the fruit of the well-known snowberry bush, although it is frequently seen feeding upon bread crumbs, apple-parings and similar kinds of kitchen refuse. It is also remarked in early spring to regale itself on certain coleopterous insects which then begin to show themselves, capturing them on the wing somewhat after the manner of the true fly-catchers.

Few birds carry themselves more fearlessly among the scenes of civilization than this one, notwithstanding that its career is mainly recluse. In Minneapolis it frequently appears in the gardens and dooryards even in the very heart of the town; and with the marked beauty of its plumage and briskness of its ways, receives no little complimentary notice.

Occasionally one finds this bird caged in Minnesota, as in our severe winter weather it is readily taken in a common quail trap baited with apple. The species is, however, but poorly adapted to a life of captivity, as while it partakes regularly enough of food under these circumstances, loss of exercise ere long impairs its assimilative powers, and it succumbs to fatal emaciation. Although christened *garrulus*, the title seems a great misnomer as applied to this species, or at all events as it occurs in Minnesota; for while the species is known to very many observers hereabouts, few of these have any knowledge of its note.

My next note is on the evening grosbeak (*Hesperiphona vespertina*). Like the preceding this straggler has for the last half decade taken up his winter quarters in Minneapolis and its vicinity with almost unbroken regularity.

This also proves to be a gregarious species, seldom being seen save in troops, sometimes comprising several scores of individuals. Its usual haunts hereabouts are groves of sugar maple, the buds of which, together with the kernels of the seed of the box-elder, constitute almost its only food. It is observed with us to be even less suspicious of man than the chatterer; as it unhesitatingly establishes itself in the town shade trees, and on rare occasions, as if from motives of pure curiosity, it is seen to ramble over the housetop and up and down the porch after the manner of the wren. From its strangely ejaculatory as well as harshly piping quality, the song of the species can scarcely be compared with bird-music as one commonly understands the term. Yet notwithstanding its demerits, much of the bird's leisure time is spent in its practice both as a soloist and chorister.

The collector adds to his store the skins of the fully developed males of this Grosbeak with signal satisfaction; as from the sharply contrasted disposition of their leading hues—white, yellow and black—it is questionable whether the uniform of any of our native birds is on the whole more striking. In looking over the skins of the females taken hereabouts, they mostly disclose a whitish edging on the inner webs of the tail feathers to which the standard authorities fail to refer.

The third bird on my list is LeConte's bunting (*Coterniculus Leconteii*). The discovery that this little known species is to be included among the birds of Minneapolis is the latest ornithological novelty of which the district can boast; being first indisputably noted only during the past summer. But his presence is still far from being a familiar one in this part of our territory, as up to date he has rigidly confined himself to one particular spot. This is a large tract of meadow just outside the city limits, which, despite the close proximity of a railroad and several other scarcely less noisy highways, proves to be a great resort for many birds, among them the species in question. It has been observed on sundry occasions during the last season, and taken both in juvenile and adult stages.

One of the smallest of the sparrows, and likewise one of the least noticeable in point of attire, it is also the fate of this species to lead a career of the utmost unobtrusiveness and humility; being for the most of his time buried deeply in the grass, where he gleans the lesser grubs and more delicate seeds found to constitute his fare. In his style of flight, as well as in his song, he is almost undistinguishable from his yellow-winged brother sparrow (*Coturniculus passerinus*); in short, it may be described as the yellow-winged sparrow transferred to low grounds and marked by certain constant characteristics brought about by the change.

While the young of the bird were procured in several instances in the meadow to which I have alluded, the nest remained undetected, doubtless being hidden so securely in the grass that its whereabouts could only have been brought to light by the luckiest chance.—*W. L. Tiffany, Minneapolis, Minn.*[1]

Mode of Distribution of Fresh-water Mussels.—On April 17, 1877, the writer, while exploring that portion of the Erie Canal known as the Wide Water, near Mohawk, N. Y., unexpectedly came across *Unio rubiginosus* Lea. Five specimens in all were secured during this and two succeeding expeditions. The species has not hitherto been found on the Atlantic slope, but belongs to the Ohio basin, and, hence, to the western fauna. It has been recorded at Buffalo (*teste* Prof. C. Dewey), and at Rochester (*teste* C. T. Robinson) in Western New York, but only in streams flowing into the great Lakes. Between Mohawk and the latter localities is a ridge or water-shed sloping to the West and the East. The Erie canal passes over this ridge, and through it the species has probably been introduced and colonized. My friend, Dr. Lewis, of Mohawk, informs me that about eight years ago he found in the canal, a single specimen of *Unio gibbosus*

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[1] The nest and eggs of *C. Lecontei* are unknown, and Mr. Tiffany would do well to make thorough search for them on the spot where the species thus unexpectedly proves to be abundant.—*E. C.*

Barnes. Through the same medium other western species may be introduced.

Unio pressus Lea, was also found by the writer, near the same locality (within three miles) in May, 1877, but under conditions that preclude the possibility of its introduction in a like manner. Two specimens were taken from a small lake near Herkimer, N. Y. The lake lies between high hills and receives as its water-supply an artificial branch of West Canada Creek, a mountain stream having no connection with the Erie canal, or any stream that could possibly reach it from the west or south. It empties into the Mohawk, but over a very rocky bed, and after a considerable fall. The species is essentially western, but is recorded at Troy, N. Y. (Vide Lewis in Bulletin Buf. Soc. Nat. Sci. Aug. 1874, p. 127). Its occurrence in the latter locality may be explained, perhaps, in a manner similar to the preceding, though at no known intermediate localities has it been found. The problem to be solved is: How came this western species in this isolated eastern lake? Mr. Darwin, (in "Origin of Species," p. 344, Ed. 1877) has conjectured a probable mode of distribution, relating particularly to certain fresh-water univalves. What Mr. Darwin conjectured the writer has actually seen. The same may occur with bivalves, and certainly does. Mr. Arthur F. Gray, of Danversport, Mass., has informed me of the foot of a water-fowl, now in his possession, to which is attached a bivalve shell, the former caught and firmly held by the latter.

The young of Uniones, since they are capable of swimming freely about, may be distributed in the manner suggested by Mr. Darwin; viz: attaching themselves to pond-weeds, the latter being often carried away by water-fowl. That *Linnaeæ* and *Planorbis* do thus attach themselves every collector knows. Whatever the manner or cause of its introduction *Unio pressus* is found in the above lake, absolutely foreign to any *stream* through which the species might have been introduced. This species, as well as the preceding, may yet become colonized in the Mohawk River. The fact of its occurrence now and its probable recent introduction in the locality mentioned, under conditions that seem physically impossible, may be of interest when the geographical distribution of the Unionidæ comes to be more fully studied.—*R. Ellsworth Call.*

DEFENSIVE URINATION OF THE FROG.—On the Iowa prairies, often a mile from any water, one frequently meets with frogs which leap out of the way in a very startled manner. Generally, as the first leap is made, the frog ejects a quantity of water, which falls in a mass to the amount of a fluid ounce or more, with a largely diminished quantity the second time he springs from the ground. The idea which naturally occurs to the observer, is, that this water is the ordinary urine of the reptile, voided in this manner in consequence of the muscular action occasioned by his sudden fright. But I once saw a common garter or striped snake spring suddenly after a frog in an attempt to seize him. These snakes are reasonably active when they proceed in the ordinary style; but when they are attempting to seize their prey their motions are so quick that the eye must be very intent to follow them. In this case the frog was just a hair's breadth of time too quick for the snake, making a high and vigorous leap forward. As he sprang the usual evacuation of water fell from him, striking the snake fairly on the head, and most probably filling its open mouth. One or two more leaps in instantaneous succession carried the frog out of danger, and he was not made a meal of. But the snake was evidently blinded by the urinary discharge, for he wriggled and twisted, sprang wildly around from side to side, and was completely thrown off the track of his game. My sympathies were with the frog, and I thought in regard to that obfuscated snake, "served him right." The incident was, of course, an amusing one, and thinking of it afterwards, it occurred to me that this habit of the frog might very properly be classed as a defensive one. The snake is its usual, most frequent and most relentless enemy. Having glided noiselessly through the grass it finally makes a spring for its victim in precisely such a way as to be enveloped in this discharge, should it fail to seize the frog. The snake has no "winkers" to its eyes, and of course cannot quickly correct the blinding effect which even pure water suddenly dashed upon its head would necessarily produce. The light must be variously refracted, and images falling upon the retina very badly mixed up and distorted. In the "noise and confusion" thus arising, the frog makes good his escape. While the secretion and discharge of the urine is an ordinary physiological process, its use in this manner may be none the less a means of defense The force of the ejection, doubled by the action of the snake in nimbly darting from the opposite direction, the amount ejected and the circumstances attending the act, all seem to justify the inference that this, aside from concealment in the green herbage, is about the sole means of defense provided —"developed"—by nature to aid the harmless and inoffensive frog in evading the clutch of its alert and nimble enemy.—*Chas. Aldrich, Webster City, Iowa.*

REMARKS UPON ALBINISM IN SEVERAL OF OUR BIRDS.—During the autumn of 1876, I saw a pet crow (*Corvus americanus*) bearing rather strange markings of a grayish color over the rump, sides and abdomen, as well as about one-half of the tail feathers. Upon the approach of winter the bird accidentally had the tail pulled out; when about two months later, it was replaced by feathers of a pale gray tint. During the coming moulting season, the parts which had previously been of a grayish color, now became white, and in addition several quills in both wings. I became the possessor of the specimen and kept it for several months, when the bird grew sick and died. The disease affected the skin and feathers to such an extent that it was unfit for preparation; although the specimen was for some time a matter of public curiosity. An instance of total albinism occurred some years ago in Lehigh County, Penna., where the bird was kept for a number of years as a bar-room pet. Another example occurred during the winter of 1873-74, in Montgomery County, Penn., where the specimen was secured while a hunting party happened upon a rookery during the night. A great many birds were shot and amongst them the albino.

Several instances of total and partial albinism in *Turdus migratorius*, have come under my observation in Pennsylvania. In several of the supposed cases of total albinism, a pale yellowish tint could be discovered upon the tips of the feathers over the breast and sides, which was replaced upon the back by a slight grayish or ashy shade; although at a short distance they appeared perfectly white.

A female *Hirundo horreorum* was secured in the summer of 1875, near Reading, Penna., which had patches of white upon either side, extending upwards and forwards to the base of the wing. The left wing also contained several white secondaries.

From the spring of 1874, to the summer of 1877, four different specimens of *Passer domesticus* have come under my observation which were partly white. The markings were irregular and included parts of the wings, rump and abdomen, or as in one instance, the tail feathers. One specimen of total albinism was seen in the streets of Reading for several months, when all of a sudden it disappeared from its usual haunts, no doubt being secured by a collector for the adornment of his cabinet.

There is at present in a collection in Reading, an example of a nearly white *Buteo borealis*. The only defect consists of pale yellowish brown transverse markings near the tip of the tail feathers. There are visible upon close examination, delicate ashy tinted median lines in the feathers of the head, neck and back. In all other respects the bird is certainly interesting.

Partial albinism in *Agelæus phœniceus* is not of uncommon occurrence, when one is on the lookout for such specimens. In the collection before referred to, are several males with the deep red and yellow colors upon the wings, but which in other respects appear very different. The color at a short distance appears yellowish-brown, which upon closer inspection, results from that color tipping all the feathers over the body. In another specimen, the red of the wing is replaced by deep orange.

Frequent specimens of *Sturnella magna* occur which would readily be taken for *neglecta*, were the observer ignorant of the locality. They resemble the latter very closely, but do not have the characteristic note of the western variety. There are more than half a dozen specimens in the aforesaid collection, all having similar markings and shade.

In addition to the above, *Calamospiza bicolor* frequently varies. Odd white feathers are scattered indiscriminately over the neck or breast, as was noticed in a number of specimens secured on Heart River, Dakota Territory. One specimen in my collection, has but a single white feather on the throat, though that appears rather prominently upon the black back ground.—*W. J. Hoffman, M.D.*

MODE OF MOULTING OF THE LINING OF CROP AND STOMACH IN INSECTS.—Attention has been lately directed to the mode of moulting by German zoölogists, especially from the histological stand-point, with interesting results. Dr. Braun has published an article on the histological occurrences in the moulting of *Astacus fluviatilis* in Semper's Arbeiten (ii. p. 120, 1875). In the same Journal and volume Cartier gives the results of his studies on the finer structure of the skin of reptiles, Kerbert has recorded his observations on the skin of reptiles and other vertebrates in Schultze's Archiv. für Microscopische Anatomie (xiii), and, during the past year, Dr Wilde has made known his observations on the mode of moulting in the grasshoppers and locusts (Wiegmann's Archiv).

In the reptiles as well as in the craw-fish (*Astacus*), moulting is effected by the growth of fine cuticular hairs of temporary growth which originate on the new skin, and grow up, thus loosening and pushing off the old skin. When this is accomplished these deciduous hairs disappear. This has been observed in the reptiles as well as in Astacus. Exceptions to this rule only occur in the reptiles on certain parts of the body, as for example the under side of the scales, the capsular skin of the eyes; in the crawfish the faceted cornea of the eye, the eyestalk itself, and the inner lamellæ of the fold of the carapace over the gill-openings.

It has probably been noticed by many that in moulting, the crayfish and lobsters cast off the solid chitinous lining of the crop and fore-stomach (proventriculus) the large teeth lining the latter remaining within the cast skin. It is so with the chitinous, teeth-bearing lining of the crop and fore-stomach of insects.

Dr. Wilde maintains that the moult of the crop and proventriculus (fore-stomach) follows that of the integument, and according to Braun the formation of a new cuticle in the stomach of the crayfish results at rather a late period after the change of skin. In the Orthoptera (grasshoppers and locusts) as soon as the moulting has taken place, the old cuticula of the crop and fore-stomach has disappeared. Wilde found that in several species, when about to moult, in all cases the old chitinous layer of the crop and fore-stomach was separated from its under layer, a new cuticula already being present. If we cut open the crop longitudinally we can remove the old cuticle without difficulty, a proof that it is cast off *in toto.*

Braun has maintained that the solid hairs and their modifications in the crop and fore stomach of the crawfish, are comparable with the cuticular hairs of the same animals; i. e. are merely for ornamentation, but Wilde considers that the homologous spiny hairs in the crop of the Orthoptera triturate the food (their function is, however, evidently to prevent the food from regurgitating into the mouth, together with the peristaltic action of the crop and digestive canal). That these hairs lining the crop and fore-stomach are useful in throwing off the old cuticle is plain, but this is only a purely secondary use. Wilde says he has observed the process of moulting in *Locusta viridissima*, *Decticus verrucivorus* and *Gryllus campestris* in the clearest manner, favored in part by the peculiar inner structure of the crop in the last. All the hairs and hair-like growths in the crop and proventriculus of the Orthoptera, take their origin not from cell-tubes, as is mostly the case in Astacus, but they are in the Orthoptera much more solid, and originate like spines on the chitine cells, like the projections on the flame-like cells (flammenzellen) of the walrus, as observed by F. E. Schulze. In no case is the moulting, in Orthoptera, performed as in Astacus and the reptiles, where two or three solid bristles are developed in a cell, by which the old cuticle is loosened. In the Orthoptera it rises simultaneously throughout its extent, so that the new cuticle rising under it, whether in the form of hairs or flattened, hairless chitinous growth, elevates the old cuticle as it keeps on growing (Fig. 23). As soon as the old cuticle is stripped off, the new cuticle completely formed is to be seen under it. It is, indeed, completely hyaline, and reminds one of the cuticle in the orthopterous larva, just after exclusion from the egg. Yet it takes on, after a few days, probably through the influence of the air, which passes through very fine tracheal twigs under the layer of epithelium, the characteristic yellow-brown color of the chitine. The secretion of the new cuticle must proceed with great rapidity. It does not take more than one, or at least two days to develop. Wilde does not state how the cast chitinous lining of the crop and proventriculus passes out of the narrow œsophagus and pharynx.

Ornithological Notes.—The habit of laying in other birds' nests is a well-known peculiarity of the cow-blackbird (*Molothrus pecoris* Sw). It seldom happens, however, that the intruder is successful in depositing more than one egg in a nest, yet I found a grass-finch's nest last summer which contained five eggs, three of which had been laid by the cow-bird. On the plains of Colorado I have frequently found single eggs of the latter deposited on the bare ground, and this fact was accounted for by the absence of timber in which birds might find suitable conditions for nidification. In one day I picked up *two* eggs of the cow-bird at widely separated points, and an examination discovered them to have been recently laid. In the absence of the nests of other birds, therefore, the cow-bird will drop its eggs indiscriminately in times of sudden or unexpected delivery.

I met also, a few years ago, with a singular case of the ovipositing (or reproductive parasitism, I could not determine satisfactorily which) of the meadow-lark (*Sturnella magna* Bd.), in some degree analogous to that of the yellow-billed cuckoo. One nest which I found near Parkesburg, Penna., contained five eggs which had been laid at two distinctly separated periods, and, to all appearances, by two different individuals. Three of the eggs were smaller than the ordinary eggs of this bird and were so far advanced in the stages of incubation that I found it impossible to remove the contents without destroying the shells. The remaining two, however, were much larger and perfectly fresh. There was no doubt, however, that all were of the same species.—*E. A. Barber.*

ANTHROPOLOGY.[1]

ON THE PROBABLE USE OF DISCOIDAL STONES.—There is one class of pre-historic relics which has been treated or referred to by nearly every writer upon archæology, with nearly as many theories and conjectures as to the probable use. Schliemann devotes many pages to illustrations, most of the specimens bearing exquisite designs in ornamentation. England, Ireland and several continental localities have yielded numerous examples of the same style of relics with less ornamentation. The mounds throughout the Ohio and Mississippi valleys have furnished many highly wrought specimens, but rarely any with any attempt at ornamentation. These relics occur of various materials, such as diorite, syenite, quartzite, novaculite, greenstone, jasper, and in a few cases catlinite. They are circular, concave on either side sometimes, and I might say generally have a hole in the middle, varying from one-eighth to one-fourth of the total diameter. The periphery is seldom flattened but usually slightly convex, showing no trace of wear, but on the contrary, perhaps more highly polished, if that be possible, in many of those found.

There are two predominating sizes; specimens of the first class averaging from three to six inches in diameter, while those of the second are generally less than two inches. These may again be subdivided according to their perforation, ornamentation, etc., but it is not our purpose to dwell upon these points. The smaller specimens, which are found to exceed the larger in great proportion, were no doubt used in games, similar to tossing pennies and winning upon certain pre-arranged agreements. There may have been some colors used to distinguish one side from the other, and as colors, manufactured and applied by aboriginal races are easily removed, we can readily account for their absence

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[1] Edited by Prof. OTIS T. MASON, Columbian College, Washington, D. C.